

WHAT IS CLAIMED IS:

1. An apparatus for improving soft ground, comprising:

an injection rod (20) including an injection pipe (10)
5 into which fluid is introduced, and an outer casing (12)
disposed around the injection pipe (10) with an air feeding
path (14) therebetween;

one or more injection holders (40) coupled to an outer
surface of the outer casing (12) to be positioned at different
10 levels and to be inclined downward; and

a bit (30) coupled to a lower end of the injection rod
(20), and having jet holes (60, 60a), which are inclined
downward and in which inclined jet nozzles (70, 70a) are
inserted, and a cutting water nozzle (74) provided at its
15 center.

2. The apparatus as set forth in claim 1, wherein the
injection holders (40) are coupled to the injection pipe (1)
and the outer casing (12) to be horizontally positioned.

20

3. The apparatus as set forth in claim 1, wherein each of
the injection holders (40) includes:

a tubular connecting holder (42) coupled to the injection
pipe (10) through the outer casing (12);

25 a flange (46) disposed under a lower end of the connecting

holder (42) and having a plurality of air guide holes (44);

a nozzle (50) fitted in the flange (46);

a jet guide holder (90) having an upper space (52) in which the nozzle (50) fitted in the flange (46) is received, and a drain hole (56) having a diameter smaller than that of the space (52) and connected to the space (52), in which a snap ring (54) is partially embedded in an inner surface of the jet guide holder (90) to support an upper end of the flange (46), with a check rubber ring (84) disposed under the flange (46) in the space (52), and a support cap interposed between the flange (46) and the check rubber ring (84) to support the check rubber ring (84); and

a protection pipe (96) threadedly coupled to the jet guide holder (90) at its one end and coupled to the outer casing (12) at the other end.

4. The apparatus as set forth in claim 2, further comprising a check packing (92) provided under the flange (46) in the space (52) of the jet guide holder (90).

20

5. The apparatus as set forth in claim 2, wherein the nozzle (50) fitted in the flange (46) includes an arched concave surface (98) and an inclined surface (98a) at its upper end.

25